

HOW TO LAY PORTLAND CEMENT STEPS, CURBS AND SIMILAR STRUCTURES.

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The lower step is always laid first. A concave frame, seven or eight inches high, is useful in making steps with a convex "rise" or front. The face of the frame is planed smooth and sometimes painted with shellac. The second step laps over the one below.

When ready for the step, concrete is packed in behind the frame, but not against it. Rich mortar one inch in thickness is plastered along the face of the frame, a little at a time, to keep away the concrete, which is tamped all the time it is going in, great care being taken to make a good job. The tread of the step is finished, and as soon as the step is hard enough to stand alone, the frame is removed, and the face of the step finished with a steel trowel. The tread should be fourteen or fifteen inches wide when another step is to be laid above, and it is not necessary to finish a step back of the tread, as this part will be covered by the next step.

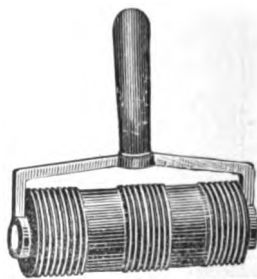
Where curbing is to be laid adjoining a cement walk, some days should be allowed to pass, to let the walk get hard and tough, before putting in the curb. Tar paper should be used to make the separation complete. The outside only of the curb is rich mortar; the interior is composed of concrete, the same as with steps, and mixed one to five. Around stores and railway stations the outer course of flagging sometimes acts as a curb, and is built in the same manner as a step, having a rise of seven or eight inches in front: and, to avoid danger of breaking, diminishing in thickness gradually from front to back. Even this may be broken by an asphalt improvement resting against the walk, instead of going under it. In many places curves can be introduced with the finest effect, as in private grounds, around houses or in parks. Here ash ribbons are useful, in place of scantlings, in laying out the walks.

In order to prevent horses from slipping stable floors and driveways of artificial stone are usually marked across the surface with line or dot rollers.



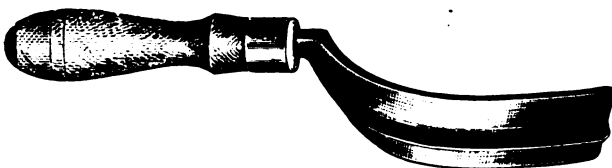
LINE ROLLER.

It is no benefit to a walk to have mortar plastered on the sides after the scantlings are removed, but at driveways one must either make an approach of concrete and top mortar or set in a stick of timber, or a three-inch plank, against the walk to protect it from carriage wheels.

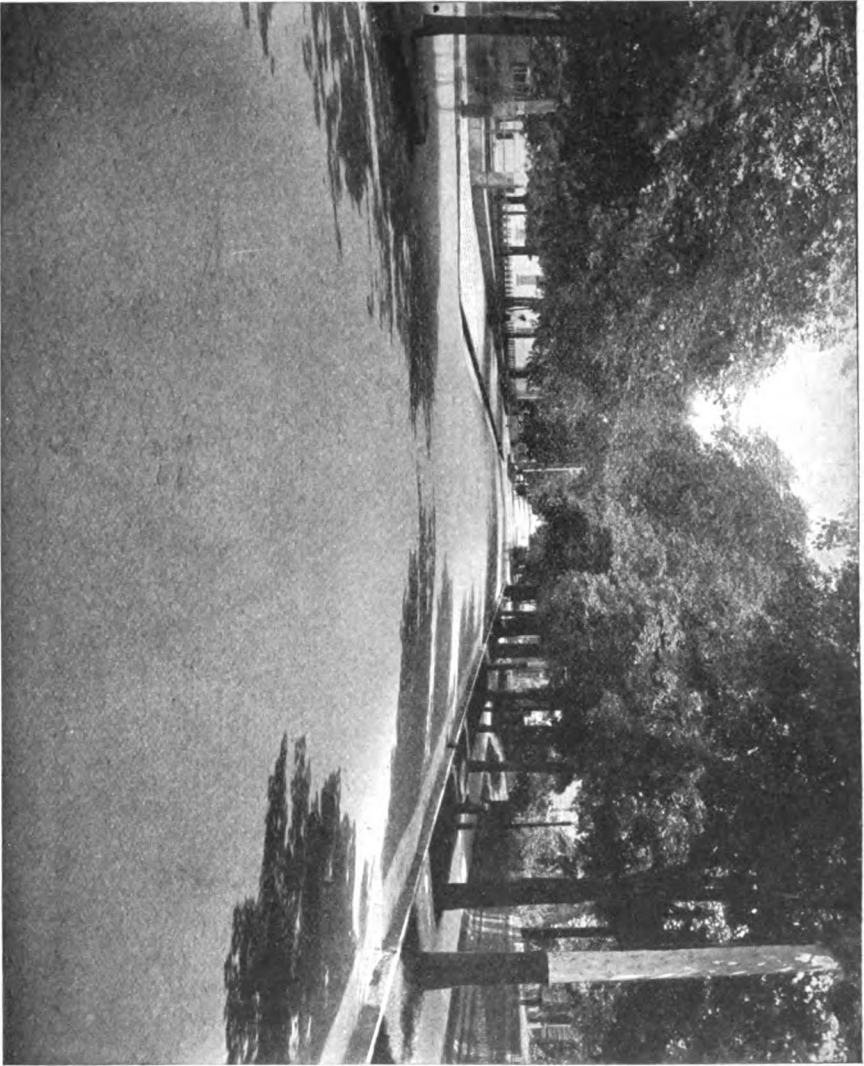


IMPROVED BRONZE LINE ROLLER.

Concrete head walls give a neat appearance to tile or iron pipe culverts along our improved roads and railways. The end tile is removed when the pit is made for head wall, and concrete two feet deep is laid to bed this tile properly; the tile is replaced and cemented around the junction with the next



ORDINARY JOINTER.



NORTH DIVISION STREET, GRAND RAPIDS, MICH.
Asphalt block on concrete, concrete gutters.

length. The open box is then set up for the head wall.

The method of manufacture is much the same as for steps. Pieces of concave molding are placed in the vertical corners of the wooden boxes to avoid sharp edges on the finished walls. The box is taken to pieces after allowing twenty-four hours' time for the concrete to harden.

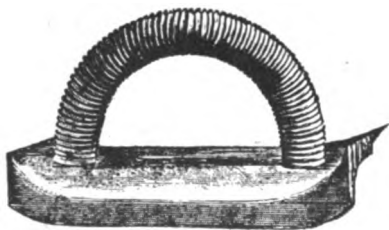
Clean water is dashed over the wall, and a little neat cement mortar is put on the vertical surfaces with a plasterer's trowel, then carefully rubbed down with a wet whitewash brush.



GROOVER.

The job is completed by laying a concrete apron eight inches in thickness in front and around the head wall, both the head wall and apron having the upper surface finished with one inch of fine mortar, like the surface of a sidewalk.

Concrete coping upon stone retaining walls and other structures.—A good effect will be produced by making the blocks about six feet long, eighteen inches high, and having them project about four inches over the face of the stone wall with the vertical joints



IMPROVED EDGER.

very strongly marked. Only every other block (the first, third, seventh, etc.) is laid at first, the others being filled in later, after the first lot has hardened. In this manner, by using tar paper the blocks can be properly separated, and means be employed to mark the vertical joints.

Cement cellar floors.—The thickness of these should be three or four inches, and the concrete should be well tamped, then a thin

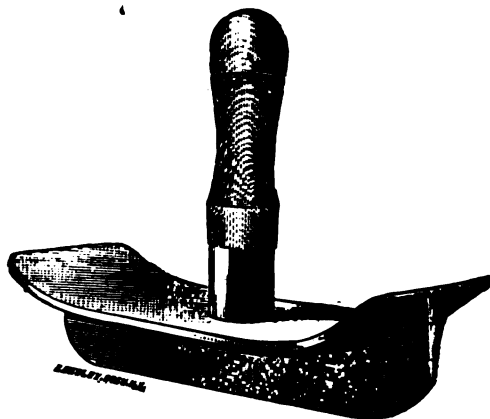
coating of good mortar spread over the top. No joints are made, but the floor should be higher in the middle than at the sides. Usually a cinder foundation is needed.

The groovers are used on cellar floors for making gutters to lead the water around to the trap.

If one can obtain finely broken stone, such as will pass through a screen with 121 meshes per square foot, it should be used with clean, sharp sand in making concrete.

There should be some pieces of two-inch porous tile under the lowest part of a cement walk to carry water away.

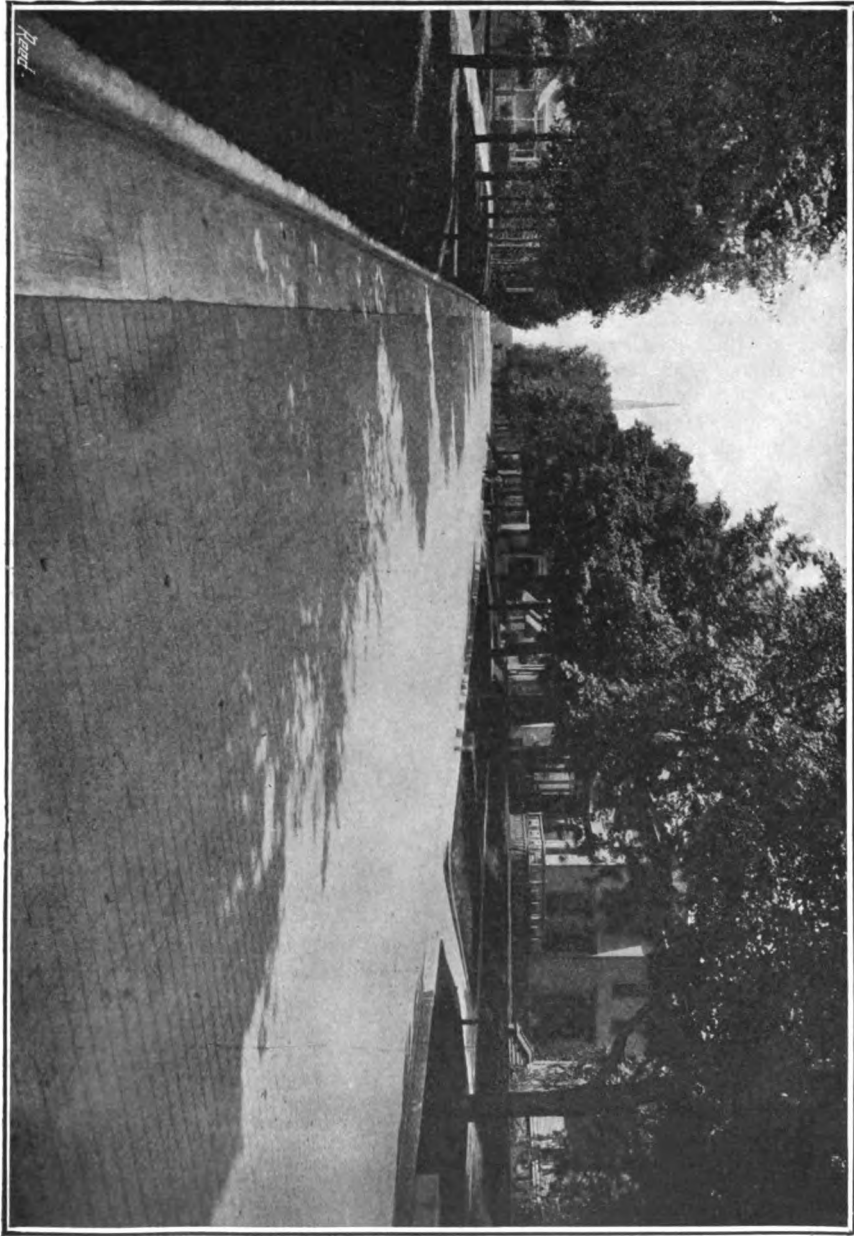
Wooden covers ten feet long are useful to protect new walks from damage. They should be made so that one end will lap over the next cover six inches. Two or three tarpaulins, eight feet wide and twenty or



ORDINARY EDGER.

thirty feet long, made of heavy, old sails are useful to throw over cement which is left over night on the work, when a rainstorm might ruin it. The cement is kept off the ground, raised high on planks with air circulating under it. In case of a sudden shower while one is laying a walk, the tarpaulin is thrown over covers raised high on empty barrels, thus protecting the walk while it is being finished, and keeping the rain away, which a leaky cover would not do. It is well worth while to use these precautions to save a walk from injury, as otherwise one may often lose fifteen or twenty dollars by a single rain storm.

Edgers of several designs are used to round off the edges of walks and head walls, and of still other forms on curbs. There are many designs of jointers to suit the taste of walk makers.



SHELDON STREET, GRAND RAPIDS, MICH.
Asphalt block on gravel, combined curb and gutter.